

Learning in Unexpected Places: Empowering Latino Parents

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Introduction

Time and again we are reminded that while schools are indeed critical places of learning, a great deal of learning occurs outside formal school settings. Family learning occurs in a variety of environments—the home, the playground, the market, and cultural institutions like museums, particularly among diverse cultures and ethnicities. Museums are often located in the heart of large cities and urban centers—areas of great demographic diversity. However, there is little research as to how diverse audiences utilize museums as family learning experiences; instead we have only anecdotal indication that these facilities are indeed under-utilized by diverse populations (American Association of Museums, 1992).

The urban neighborhood surrounding the natural history museum at the focus of this study is primarily Latino with a strong sense of community and dedication to family. When the opportunity arose to participate in a national initiative dedicated to increasing science literacy among urban families, the museum felt it would be an appropriate vehicle through which to learn more about connecting with diverse audiences in their own neighborhood.

Literature Review

The unique offerings of informal science learning facilities such as zoos,

aquaria, and museums are what make them appropriate learning environments for so many different individuals, regardless of age, socio-economic status, culture, and ethnicity. Ramey-Gassert, Walberg, and Walberg (1994) note that informal environments are unique in that they can be less threatening than formal, classroom situations and thus well suited for family groups who may have differing levels of comfort with traditional academic environments. With literature that acknowledges the detriment a discontinuity between home and traditional educational settings like school can have on minority children (Laosa, 1977; Moreno, 1991) this unique aspect of museums makes them well positioned to support science literacy for diverse audiences.

Several theorists identify qualities that support science learning for diverse audiences and how these qualities are naturally infused in museum learning experiences. Howard Gardner, father of the theory of multiple intelligences, often cites the special role museums can play in providing experiences with multiple modalities—specifically, that museums provide “opportunities to approach things in one’s own way” (Gardner, 1993, p. 11).

According to Watson and Houtz (2002), context-embedded experiences are critical in sharing science content information with culturally and linguistically diverse audiences. They define context-embedded experiences as those that incorporate “objects, body movements, pictures and hands-on materials” and go beyond “language only to convey meaning” (p. 270). As learning sites focused on objects and active participation, museums clearly embody a context-embedded experience.

In agreement is the National Science Teachers Association (1998) which affirms informal learning venues “effectively serve the complete spectrum of learners: gifted, challenged, non-traditional, and second language learners” (p. 17).

Despite the literature in support of museums’ unique offerings being well suited for a variety of learners, many museums do not attract a diverse visitorship. As a recognized deficiency, the American Association of Museums (1992) is encouraging museums through best practices documents to reach out to communities underrepresented in past visitorship demographics.

Making Connections

Attracting new audiences to partake of learning experiences in museums goes beyond simply issuing an invitation. It includes creating a place where a multitude of cultures feel both welcome and valued and see personal relevance. In fact, research demonstrates that greater learning gains are observed in a museum setting when visitors can make these personal connections (Serrell, 1996; Hein, 1998). In addressing the concept of creating a welcoming environment, Lucas, Henze, and Donato (1990) focus on the importance of valuing and incorporating the primary language of program participants as a key factor to program success.

For museums serving an urban population, there are unique elements to growing up in this environment that are important to understand. Jesse (1997) specifically points out that in working with urban parents, it’s important to provide opportunities for parents and children to learn together, creating an empowering

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opportunity for parents. Bartlett (1997) describes the effect that not having safe outdoor areas for play can have on children of urban families—specifically, the amount of independence these parents allow their children. These were all elements that needed to be considered during the design of the project which would not only call for conducting outdoor activities within the surrounding neighborhood, but would need to build-in experiences to specifically empower participating parents in the area of science content, an area many find intimidating regardless of ethnicity, SES, or education level.

The work of Maslow (1968) reminds us that before higher cognitive activity can take place, the basic needs of psychological safety and belonging need to be addressed. Thus, before parents can be empowered, they need to feel comfortable within the learning environment. This issue of comfort has been echoed and addressed in depth by a number of researchers (Wolf, 1992; Falk & Dierking, 1992). In an early study on museum attendance in a metropolitan area, Hood (1983) identified that the non-participants to museums, those that visited only occasionally or not at all, did not identify these institutions as comfortable or familiar environments.

For example, in a recent doctoral study, Latina mothers who had never visited their local museum before explained a fear of not being welcome, not knowing the answers to questions their children may ask, and not feeling that they were knowledgeable enough to appreciate the museum as a learning environment. In short, they felt the museum as a place for “other people” (Melber, 2003).

The Need for Science Literacy

An important part of the missions of many science museums is to support and promote science literacy among their visitors. The need for improved science literacy for all is critical. A study by the National Science Board (2002) polled a cross section of the public nationwide measuring attitudes toward current issues in science and technology. Of those surveyed, only 14% considered themselves “very well-informed about new scientific discoveries.”

This lack of science literacy extends to the nation's children as well. The 2000 National Assessment of Educational Progress (NAEP) in Science indicated that two-thirds of students nationwide scored below a “proficient” level of understanding in science (National Center for Education Statistics, 2003a; 2003b; 2003c).

The need for improved science literacy on the part of diverse populations and multicultural youth is even more critical. Non-Caucasian students scored below Caucasian students at all three tested grade levels on the 2000 NAEP in science (National Center for Education Statistics, 2003d). This gap extends into higher education and science careers where individuals of color are still significantly under-represented (National Science Board, 2002). It is important to note his gap persists among professionals who have gone on to earn higher educational degrees. Even our most highly educated individuals of color as still not selecting professions within the sciences with as great frequency as their Caucasian peers (National Science Board, 2002).

With data that demonstrate that childhood visits to informal learning institutions such as museums can be influential in the development of scientific career or hobby activities later in life (Cosmos Corporation, 1998; Csikszentmihalyi & Hermanson, 1995; Nazier, 1993), some consider museums well placed to address this gap. A recent study by Quita (2003) posits that unbiased science instruction and providing student with opportunities to see that science occurs cross-culturally can result in less biased student perceptions of who can be a scientist and who can *do* science successfully.

An Opportunity To Connect

The museum at the focus of this study was offered the chance to participate in a program that would compliment efforts to connect with neighborhood residents through programming. This vehicle was a program titled “PIPE: Parents Involved, Pigeons Everywhere.” Designed to promote parent-child interaction in scientific discovery, the program teaches families how to collect information on the different color phases of pigeons they observe in their neighborhood, recording that data as a field ornithologist would, and then with the assistance of the coordinating institution, sending that data to Cornell Laboratory of Ornithology for inclusion in an actual, ongoing research study. This project is based in research that understanding complex scientific concepts is made easier by using familiar topics as a vehicle. What is more commonplace than an ordinary pigeon?

Funded by the National Science Foundation, the program was collaboration between The American Association for the Advancement of Science (AAAS), and KCET Community Television of Southern California and the Cornell Laboratory of

Ornithology. It was based on a successful Citizen Science project titled Project Pigeon Watch developed at Cornell. This exploratory study is not an evaluation of the PIPE program itself, but rather an inquiry into methods the museum found successful in collaborating with local, Latino families and increasing their comfort with accessing museum resources.

Study Setting

The need for reaching out to the local community was both theoretically clear within the literature and anecdotally clear at the focus institution at the time of this case study. It was just a year after this case study, however, that several unrelated studies were conducted that specifically quantified this need. The Institute for Learning Innovation (2000) identified that 21% of the museum's visitorship was Latino.

Though this is nearly a quarter of the museum's visitorship, it is not reflective of the greater Latino presence in the surrounding community, approximately 70% (South Service Planning Area, Los Angeles County Department of Health Services, 2002). A series of focus groups with local community leaders identified that the museum would benefit from “making greater efforts [to attract the neighborhood audience]” (Lord CRPM, 2000, p. 7) and “not only make itself more visible...but also teach people how to use the museum” (p. 11).

Study Focus

This case study looked specifically at how museum educators were able to connect with members of the surrounding community through the PIPE program and how they met (or did not meet) the following goals: (1) Identify successful ways of attracting local, Latino families to the museum as visitors and program participants; (2) Increase comfort level with the museum on the part of this local Latino community; and (3) Increase understanding of museum scientists and scientific work.

Program Description

The museum in this study decided upon a program structure consisting of three contact days where museum staff were directly interacting with the program participants: Parents' Meeting I, Family Fair Day, and Parents' Meeting II.

Parents' Meeting I: The first parents' meeting was an opportunity for participants to learn more specific information about the project and how they would be

implementing it with their children. They received a number of program materials, spent time viewing a video about the program, and learned about the activities that would take place at the Family Fair. This preview was designed to empower parents in a location they may be otherwise unfamiliar with so they would be able to serve as facilitators of knowledge when they returned with their families.

Family Fair: The Family Fair was a chance for parents, children, and museum staff to do pigeon watching together and take part in other bird-centered activities. These included bird watching with the museum ornithologist, a behind-the-scenes tour of the ornithology collections and lab, and hands-on activities involving bird bones, bird eggs, and feathers. Families received bags with hands-on science investigation materials as well as non-fiction books on bird biology and behavior to take home. They also received guest passes to return to the museum free of charge.

Parents' Meeting II: The original goal of this meeting was to provide parents with a venue to share their opinions on the project. As few mothers could attend, follow-up was conducted through phone and mail correspondence.

Methodology

As an exploratory study, data from this inquiry are focused on better understanding the experience of each of the participating families in accordance with an ethnographic approach as outlined by Patton (1990), on the central question of "what is the culture of this group of people" (p. 67), and specifically on how they relate to the culture of a museum environment.

Participants

One stipulation of the granting institution was that participants be low-income families. It was the choice of the museum to also focus primarily on Latino families who form such a strong community within the neighborhood. Participants were selected through scholarship files kept for the museum's fee-based children's programs, inviting select contracted service staff of the museum, and encouraging those that chose to participate to also invite family members.

These methods resulted in a sample size of eleven families that were invited to participate. Attrition of this sample led to seven families from whom data were collected, one of whom was not Latino

and thus not included in the results presented in this work. Therefore, the final study sample presented here consisted of six Latino families. For each, the mother of the family was the main contact and leader of the collaboration. It's important to note that reliable attendance at parental involvement programs can be a challenge in any setting and attrition rates have been problematic for many researchers (for example, Floyd 1998).

Spanish was the first language for the parents of all six of these families. There were varied levels of English proficiency so a translator was made available at all stages of the program. While elementary children were the target of the program, additional family members were often also in attendance and welcomed by the facilitators of the program, from toddlers to adult children.

Data Collection

Data was collected in three main ways:

Pre-Questionnaire: A pre-questionnaire was completed by parents who attended the first meeting. Those that were unable to attend completed a questionnaire through the mail. This provided a general overview of how parents perceived the museum prior to implementation of the program.

Pre/Post DAST Derivative: A derivative of the DAST (Chambers, 1983) was used to establish a portion of the parents' understanding of what "scientists do" both prior to their experience collecting data and working with a museum scientist and then after their experience with a museum scientist. The test acknowledges certain "stereotypical" images the public associates with science and scientists and illustrations are analyzed to look at the extent to which these images are incorporated. The traditional procedure outlined by Chambers (1983) was not utilized due to the small sample size, but rather general themes were identified and compared with each individual's "before" and "after" drawing.

Post Questionnaire: This questionnaire measured specific reactions to the program and was administered after participation in the program. Participants indicated through self-report if they were more comfortable visiting the museum after participation in the program and if they had a better understanding of the work of a scientist. Response frequencies were calculated and supported by individual quotes.

Results and Discussion

In reflecting upon the three focus areas of the study the findings indicate the program did establish a successful collaboration with the program participants and increase their comfort level both with the museum and with the work of the museum scientists. In addressing the three focus areas:

(1)

Identify successful ways of attracting local, Latino families to the museum as visitors and program participants

The program successfully identified ways to encourage families from the surrounding community to participate in museum programs in a way that was inviting and comfortable. This included accommodating extended family members of all ages in the program's activities, and acknowledging non-traditional work schedules in the scheduling of activities.

The role of language in the collaboration cannot be overstated. Having all materials translated into Spanish—videos and written documents—was imperative for these families to participate in a way that was respectful of the community's diversity. Beyond that, however the role of verbal language was equally important if perhaps unstated. A translator was provided at all meetings, however, two key program facilitators though not of Latino descent were Spanish proficient and whenever possible relied on their own Spanish skills to communicate with participants, oftentimes asking for the mothers to assist with vocabulary or grammar.

As the instructors struggled over verb conjugation and intricate vocabulary choices such as "pinchon" versus "paloma," many of the participants reported they felt more comfortable using a mix of English and Spanish realizing this was a learning environment for everyone. This seemed to create an environment of equality and mutual instruction that helped put everyone at ease.

Unfortunately, there was not a formal system in place to track program participants and determine if they returned to the museum based on this particular programming experience. This is clearly a significant limitation of the study and would be a recommendation for inclusion in any future studies.

(2)

Increase comfort level with the museum within the local Latino community

Self-report on the pre and post questionnaires indicated that participants' comfort level was raised through participation in the program.

The pre-questionnaire contained a question specific to participants' comfort level with visiting the museum with their children. They were asked in two separate questions what makes them feel comfortable when visiting and what makes them feel uncomfortable. Out of the six questionnaires, one cited that nothing made her feel uncomfortable (she was a contract staff member, serving within custodial services), three cited that not being able to answer questions or understand the exhibits made them uncomfortable, and two cited that they often feel fatigued from walking—a common complaint in a large museum. When asked what made them comfortable, all six referred in some way to the interesting or beautiful displays that both they and their children enjoyed viewing.

Post questionnaires were completed by five of the six subjects. One question on the questionnaire specifically addressed an increased comfort level incoming to the museum. ("Do you feel more comfortable coming to the museum with your family after participating in this project? Why or why not?"). Four of the five respondents answered "yes," they did feel more comfortable coming to the museum. The one who responded "no" was a museum contract employee who stated that she already felt comfortable. From the four that answered in the affirmative, the reasons they gave for their response were:

Mother A: "Because after the project my family and I want to learn more."

Mother C: "Because we know more about the birds that are in the museum."

Mother D: "Because I have more confidence and I know more."

Mother E: "Because we learned together and exchanged ideas."

A general theme of increased comfort with the process of learning, a desire to learn more, and feeling more knowledgeable and empowered is pervasive through the comments.

(3)

Increase understanding of museum scientists and scientific work

The results of the modified DAST indicated the participating mothers did form a richer understanding of the work of scientists in general, and particularly the work of the museum scientists. Especially significant was the inclusion of elements such as collections storage and field investigation portrayed in the pictures, elements of scientific discovery the public is often not aware of but were central to the activities of this particular program. The small sample size makes a quantitative analysis inappropriate so a sampling of the maternal drawings are discussed as case studies.

Mother A: The first drawing completed by Mother A was a likeness of Albert Einstein, with his name written below. There is a chalkboard in the background with an $E=MC^2$ equation written on it. He has wild, bushy hair and a large moustache. His head takes up approximately 1/4 of the page with a body drawn as a stick figure that is only about 2 inches high. The second drawing by Mother A shows a simple stick figure of an individual with an aqua colored body. Perhaps the most noticeable aspect of this drawing is that there is a bird drawn on the ground in front of the individual. It can be inferred this relates to the fact that she had been exposed to a variety of experiences centered on ornithology—the focus of this program.

Mother B: The first drawing by Mother B is of a gentleman with a button up short, pocket protector, and a table with chemicals on it in the background. The shirt has a nametag that says Ramon. (There is no "Ramon" in her immediate family: husband and/or children). The second drawing that Mother B did is very similar to the first in style. The same button-up shirt is included together with a pocket protector. In the background however are shelves of birds similar to the collection storage area of the museum that families toured as part of the program. The name on the nametag is that of the museum ornithologist.

Mother C: The first drawing by Mother C is of a man's profile. The man is labeled Bela Chick and has short hair, glasses, and a tie. It resembles a picture that might be seen in a textbook and is very realistic. The second picture is an exact likeness of the museum's ornithologist, behind a desk and holding a green bird. The museum ornithologist's name is written at the top

of the page. The likeness is so stunning a photocopy of the image is displayed to this day on the scientist's office door.

Mother F: The first drawing by Mother F is of a modified stick figure with a crew cut taking notes while standing at a table. There are two jars on the table with bubbles coming out of them that may be inferred to be chemicals. The second drawing shows an individual appearing as if in flight and actively looking into a dissecting scope on a table. Both scientists are smiling.

In interpreting these drawings, three out of four showed a change in the subject matter of the illustration from either a well-known scientist in a static pose (A and C) or a stereotypical scientific scene (B and F) to an illustration that acknowledged and included events associated with the program (A, B, C). One argument is that this information may have been fresh in their mind and therefore included in the drawing. It can also be inferred however that these experiences are now incorporated into their understanding of the work of a scientist, particularly in a museum setting. Perhaps the museum ornithologist is one of the only scientists they have had the opportunity to spend extended time with.

Participant Vignette

In order to provide a more in-depth look at one mother's experience, an interview was conducted in Spanish with Mother F in addition to the data collected through the questionnaires and DAST. Mother F's first language is Spanish so a translator was used to capture the integrity of her comments. She worked with her son to answer the questions in order to incorporate his feelings and thoughts as well as her own. Therefore, the information can truly be seen as family-based.

During the program, Mother F approached the program facilitators on two distinct occasions to say how much she enjoyed the materials created by PIPE's organizers and that she had read them thoroughly. To her, it was amazing to see how useful and unique pigeons are. One of her family's favorite parts of the program was the opportunity to learn so much history about the pigeon. The fact that pigeons transported messages was especially interesting to her and she referred to it both in the oral interview and on the written questionnaire in several sections.

Mother F is an involved parent who feels very comfortable working with her children's school as a volunteer even

though she has a number of household duties that require her attention. One of the things that she really liked about the program was that she loved working with her children. Mother F also indicated she enjoyed the chance to work with the museum on the PIPE project and indicated that she would be more comfortable visiting the museum in the future because: "I have more confidence and I know it better." When asked what she would like to do with her family to learn more about science she listed experiments to learn about the different parts of animals as well as their evolution.

Conclusions

The results of this study do indicate that thoughtful collaborations with museums can support science literacy among diverse audiences and more appropriately aid in identifying museums as learning destinations for a broad visitorship. While this exploratory study does provide rich information to help guide future efforts in reaching surrounding communities and in communicating the inner working of the museum's scientific staff, it is just the beginning. Clearly, there is much work still to be done to better understand the role that museums can play in providing family learning experiences to diverse populations. Future studies with a larger and more diverse sample, and with longitudinal follow-up are imperative.

Museums are community resources and thus should be relevant, engaging, and accessible to all community members- a task easier said than successfully done. As museums move forward into the next century, there is a great need and desire for them to be relevant to a changing population. Not only are museums a great resource to the public, the public is a great resource for creating dynamic and evolving educational programming and exhibits.

A recent publication from the American Association of Museums (1992) cites that future educational efforts of museums should "become more inclusive places that welcome diverse audiences...and reflect our society's pluralism" (p. 3). In highlighting the effect museums can have on families, the National Science Teachers Association (1998) identifies that informal science learning environments such as museums "provide an effective means for parents and other care-providers to share moments of intellectual curiosity and time with their children" (p. 17).

It is realistic to assume that museums will certainly have a strong role in sup-

porting diverse communities in fostering science literacy in the future- starting with the visiting experience of families.

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